



**PATENT**

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

IN RE APPLICATION OF : Daniel F. Graves, et al.

FOR : **CO<sub>2</sub> TERMINATED RUBBER FOR PLASTICS**

SERIAL NO. : 09/819,336

FILED : March 18, 2001

EXAMINER : LU, Calila

ART UNIT : 1713

LAST OFFICE ACTION : July 11, 2003

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Cleveland, Ohio 44114-2518

**DECLARATION UNDER 37 C.F.R. §1.132**

Mall Stop - No Fee  
Commissioner For Patents  
P. O. Box 1450  
Alexandria, VA 22313-1450

Dear Sir:

1. I, Daniel F. Graves, do hereby declare and say that I am a joint inventor in the above-identified United States patent application, Serial No. 09/819,336.

2. I received my Bachelor of Science degree in Chemistry from the University of Akron in 1980. I received my Masters degree in Polymer Science from the University of Akron in 1984. I have been employed by Firestone Polymers or its

predecessor company since 1973. My current position is Division Manager of Product Development.

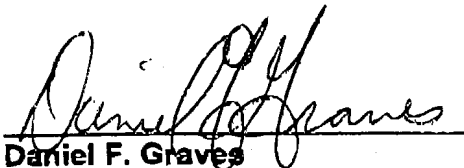
3. I have read and am familiar with U.S. Patent No. 3,791,888 issued to Hudson (hereinafter "the '888 patent").

4. Subsequent to a review of the '888 patent, I can conclude that polymer propellant binders disclosed in the '888 patent do not possess a bulk viscosity of greater than 45 and a solution viscosity of less than 75 cP, nor would they be baleable. In addition, I can conclude that the polymer propellant binders disclosed in the '888 patent would not be suitable additives to polystyrene. Furthermore, I can conclude that the polymer of the present application would not be useful as a propellant binder in the propellants disclosed in the '888 patent.

5. Although the molecular weight of a polymer is one factor that affects its viscosity, the viscosity of a polymer is not solely determined by its molecular weight. Other factors, such as the amount of branching and ionic association between polymer chains also affect viscosity. Thus, despite the fact that molecular weights up to 150,000 are disclosed in the '888 patent, the disclosed polymers would not have the viscosity values claimed in Serial No. 09/819,336, since such a polymer would be unsuitable as a binder for use in the solid propellant disclosed therein.

6. Furthermore, the polymer propellant binders disclosed in the '888 patent would not be baleable. Branching or ionic association is necessary to prevent cold flow in most polymers unless the molecular weight is extremely high (significantly higher than 150,000). Thus, the polymers disclosed in the '888 patent would not be baleable solely because they possess a molecular weight up to 150,000. This is further evidenced by the fact that a baleable polymer would not function properly as the propellant binder component of the solid propellant disclosed in the '888 patent.

7. I hereby declare that all statements made herein are of my own knowledge and are true, and that all statements are made on information and belief and are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

  
Daniel F. Graves

Date: 1/12/04